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OPERATING EXPERIENCE WEEKLY SUMMARY

Office of Nuclear and Facility Safety

June 12 - June 18, 1998

Summary 98-24

Operating Experience Weekly Summary 98-24

June 12 through June 18, 1998

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EVENTS

1. NEAR MISS DURING MOVEMENT OF WASTE CRATES

On June 11, 1998, at the Rocky Flats Environmental Technology Non-Plutonium Operations Area II, a facility manager reported a near miss for a potential radionuclide release when craft personnel moved waste crates from a storage location to the facility courtyard without any plan or work documents. Investigators determined that an inspector asked craft personnel to open the crates for inspection as required by procedures before they moved them into a waste counting facility. However, a radiological control technician suspected the crates contained contaminated laundry waste that could become airborne if the crates were opened, so he refused to open them and evoked his stop work authority. The technician notified a facility manager who directed craft personnel to band the crates and return them to the building where they were previously stored. Investigators determined that opening the crates could have resulted in a release of unknown radionuclides. (ORPS Report RFO--KHLL-NONPUOPS2-1998-0005)

Investigators determined that no one is certain of the crate contents. However, they believe the crates contain laundry waste (such as rubber gloves, tape, and plastic) because this type of crate is typically used for waste that has been segregated from the site laundry by off-site laundry personnel then shipped back to the site for disposal. Investigators determined that facility personnel cannot open the crates outside a radiological controlled area. However, facility personnel cannot meet the following requirements for moving the crates into a radiological controlled area: (1) verify that the crates do not exceed the 15-gram plutonium limit before for movement into the Non-Plutonium Operations Area II, (2) open the crates for inspection before movement into any plutonium facility, or (3) verify that the crates do not contain plutonium before moving them into any uranium facility.

The facility manager held a fact-finding meeting of this event. Meeting attendees learned that (1) no one listed the crate movement as an scheduled activity on the plan-of-the-day; (2) the shift manager was not aware of the activity; (3) no one performed a pre-evolution briefing; (4) no one generated or used waste travelers for the crate movement; and (5) no one designated an evolution supervisor for the job. The facility manager directed facility personnel to complete the following actions.

- Conduct a building plan-of-the-day/project status meeting every morning.
- Brief facility personnel on the facility requirements for performing work.
- Obtain gamma spectrometer readings to determine waste characterization.
- Determine the past history of the crates.
- Develop a new path forward for the crates.

The facility manager will continue to review this event and develop corrective actions as necessary.

NFS reported in Weekly Summary 98-11 that the DOE Office of Enforcement and Investigation issued a Preliminary Notice of Violation under the Price-Anderson Amendments Act to Lawrence Livermore National Laboratory for inadequate waste characterization and conduct of operations

issues. The Preliminary Notice of Violation was for multiple failures to implement radiological protection requirements and provide the quality controls necessary to protect workers involved in High Efficiency Particulate Air (HEPA) filter shredding operations. Investigators determined that waste characterization data was available for the shredded HEPA filter, but it was incorrectly identified on the HEPA-filter waste storage box label and on the radioactive waste disposal requisition form. They also determined that no one confirmed the label accuracy or performed radiological surveys or additional characterization of the HEPA filter before it was shredded. (NTS Report NTS-SAN--LLNL-LLNL-1997-0001; ORPS Report SAN--LLNL-LLNL-1997-0038; DOE/OAK-540, Rev. 0, "Type B Accident Investigation Board Report of the July 2, 1997, Curium Intake by Shredder Operator at Building 513 Lawrence Livermore National Laboratory, Livermore, California,")

These events underscore the importance of properly characterizing waste and clearly communicating information to workers to ensure that radioactive wastes are processed, handled, labeled, and stored in the prescribed manner to prevent a release of radiation or personnel exposure. Waste materials should be well defined to eliminate confusion or the need for interpretation, so that each person who packages, stores, or ships waste materials has the same understanding of the waste material requirements. Personnel should be able to properly identify and understand the risks involved when working with hazardous waste. In facilities that contain hazardous waste, workers should be trained in the proper methods for handling, labeling, and storing waste. Facility procedures should provide work plans for waste movement and characterization and require their use. It is important to keep records of the waste types and quantities. In this event, the only remaining barrier to a potential release was the radiological control technician. Had the technician not been present during the inspection request, craft personnel might have opened the crate and an undetected radiological release could have occurred.

Facility managers should emphasize the importance of following existing policies and procedures for any evolution involving unknown material. They should review the following reference and ensure that existing policies and procedures adequately reflect this guidance.

- DOE/EH-0256T, *U.S. Department of Energy Radiological Control Manual*, provides clear direction on the marking, monitoring, and control of radioactive materials. Chapter 3, "Conduct of Radiological Work," provides requirements for the conduct of work to ensure safety and maintain radiation exposures as low as reasonably achievable. This chapter details requirements for work planning, radiological work permits, protective clothing, work conduct and practices, communications, and radiological stop work authority. Chapter 4, "Radioactive Materials," provides direction on radioactive material identification, storage, and control.

KEYWORDS: characterization, waste handling, laundry

FUNCTIONAL AREAS: Radiation Protection, Materials Handling/Storage

2. WORK PERFORMED IN WRONG GLOVEBOX

On June 9, 1998, at the Rocky Flats Environmental Technology Site Plutonium Processing and Handling Facility, maintenance electricians disconnected a heat detector circuit in one glovebox (*XXX*), although their work package specified performing work in another (*XXX*-A). The electricians were disconnecting the heat detector circuit so fire department personnel could remove it from their impairment list when a mechanical engineer noticed the error. He informed

the electricians of the error and they notified a supervisor. The supervisor directed the electricians to reconnect the heat detector and perform post-maintenance testing. Investigators determined that the team lead orally instructed the electricians to perform this work and no one prepared or used a work package to restore the system. The shift manager placed an administrative hold on glovebox maintenance work packages. Failure to use a work package to perform work or to follow work package instructions can result in equipment damage, personnel injury, or the undetected degradation of equipment and systems essential for safety. (ORPS Report RFO--KHLL-771OPS-1998-0025)

Investigators determined that a maintenance worker performed a walk-down of the work package on the previous day and was unable to locate glovebox *XXX*-A. They determined that because the worker believed that the work package was in error, he directed the maintenance electricians to perform the work in glovebox *XXX*. Investigators also determined that glovebox *XXX* was circled on the work package drawing, but it was an information-only drawing that should not have been used to perform work. Investigators determined that the supervisor's decision to restore the system to an operable status was unnecessary because a fire watch was in place as a compensatory measure.

The facility manager held a fact-finding meeting on this event. Meeting attendees learned that fire department personnel add all identified malfunctioning heat detectors to an impairment list for repair or evaluation for disconnection. Attendees learned that facility personnel evaluated the glovebox *XXX*-A heat detector and determined that it was no longer needed and it could be disconnected and removed from the impairment list. They also learned that an engineer developed the work package to disconnect the glovebox *XXX*-A heat detector circuit. However, the engineer did not have a facility clearance, so he did not perform a walk-down of the job. Meeting attendees learned that glovebox *XXX*-A heat detector circuit was malfunctioning because someone had previously disconnected it, but no one determined this before initiating or developing the work package. They also learned that the work package contained additional discrepancies, which may have contributed to the maintenance worker's assumption that the glovebox number was also wrong.

NFS has reported on work control deficiencies in several Weekly Summaries. Following are some examples.

- Weekly Summary 97-08 reported that a procedure inadequacy allowed a valve to remain open that affected the sparging of plutonium nitrate solution at the Rocky Flats Environmental Technology Site. The open valve decreased system vacuum and affected the sampling and movement of a solution that has criticality safety implications. Investigators determined that this occurrence was the result of an inadequate review of system drawings and a less-than-adequate walk-down of the system during development of the procedure. (ORPS Report RFO--KHLL-771OPS-1997-0009)

- Weekly Summary 96-41 reported that construction electricians at the Idaho Chemical Processing Plant were exposed to an electrical shock hazard because the wrong breaker was identified in their work package. When the electricians went to install a lock and tag on an exhaust blower, they discovered the breaker listed in the work package was labeled "spare." An engineer told them that the label was incorrect and to proceed with the installation. The electricians opened the breaker, performed a zero energy check, and found the circuit was still energized. (ORPS Report ID--LITC-WASTEMNGT-1996-0013)

- Weekly Summary 96-28 reported on two events at the Savannah River Site. Electricians at the In-Tank Precipitation Facility observed arcing when they cut an

electrical cable they believed to be de-energized. The electricians used inaccurate drawings when de-energizing the cables. Operators at F-Canyon detected contamination in the FB-line process water system after the valve to an incorrect supply water was opened. Operators were following an incorrect sketch included in the procedure. (ORPS Reports SR--WSRC-ITP-1996-0013 and SR--WSRC-FCAN-1996-0004)

These events illustrate the need for facility managers to ensure that workers understand and follow work control and configuration management programs. In this event, the maintenance worker failed to follow established facility work control programs, disregarded the work instructions, and directed electricians to perform work in another glovebox. The error was compounded when the supervisor directed the electricians to reconnect the detector without using the appropriate work controls. This indicates that facility personnel may not understand the importance of following work control packages and that facility managers failed to adequately communicate the importance of work control programs to workers. Assigning an engineer without clearance to develop the package may have reinforced this perception. Facility managers are ultimately responsible for ensuring successful completion of work activities. Routine monitoring of work by facility managers and supervisors will help ensure that maintenance activities are conducted in accordance with facility policy and procedures.

Many DOE Orders, standards, and guidelines addressing work control programs and conduct of operations are applicable to this event. Facility personnel responsible for work that is performed by contractors should clearly understand their responsibilities. They should review the following Orders and standards to ensure adequate oversight and control of work activities that are performed by contractors.

- DOE O 4330.4B, *Maintenance Management Program,* chapter 15, "Management Involvement," identifies the degree of management involvement in oversight and approval of maintenance activities. Chapter II, section 8.3.1, "Work Control Procedure," provides guidelines on work control systems and procedures and states that work control procedures help personnel understand the necessary requirements and controls.

- DOE O 5480.19, *Conduct of Operations Requirements for DOE Facilities*, chapter VIII, "Control Of Equipment and System Status," states that managers of DOE facilities are required to establish administrative control programs to handle configuration changes resulting from maintenance, modifications, and testing.

- DOE-STD-1050-93, *Guideline to Good Practices for Planning, Scheduling, and Coordination of Maintenance at DOE Nuclear Facilities*, provides information on work controls and coordination.

- DOE-STD-1053-93, *Guideline to Good Practices for Control of Maintenance Activities at DOE Nuclear Facilities*, section 3.4.2, "Work Control Document," states that maintenance should be planned, controlled by procedures, and documented.

- DOE-STD-1073-93-Pt.1 and -Pt.2, *Guide for Operational Configuration Management Program Including the Adjunct Programs of Design Reconstitution and Material Condition and Aging Management*, states that physical configuration assessments or walk-downs should be performed for representative sample structures, systems, and components within the facility to determine the degree of agreement between the physical configuration and the configuration on the facility documentation. Physical walk-downs should be included as part of the

programmatic assessments conducted during initial assessments, post-implementation assessments, and periodic effectiveness assessments.

KEYWORDS: glovebox, work planning, maintenance

FUNCTIONAL AREAS: Work Planning, Electrical Maintenance

3. FISSILE MATERIAL HANDLING CONCERNS AT THE HANFORD PLUTONIUM FINISHING PLANT

On June 2, 1998, at the Hanford Plutonium Finishing Plant, the plant director discovered potential fissile material handling concerns involving movement of material out of a glovebox. The director learned that unqualified workers moved fissile material without the required supervision; communications between workers was inadequate; container spacing limits may have been violated; and labeling on transport containers was inadequate. He also learned that DOE was not informed of fissile material moves as previously agreed to and that the glovebox differential pressure gauge calibration had expired. Investigators discovered that there was no clear guidance or approved technical basis for assigning assumed mass values to fissile materials to be moved out of the glovebox. In addition, job planners significantly underestimated the amount of waste to be removed from the glovebox. Failure to meet fissile material handling requirements resulted in reduced criticality safety margins. (ORPS Report RL—PHMC-PFP-1998-0028)

The facility manager identified the following corrective actions for this occurrence. These corrective actions were identified in similar recent occurrences at the Plutonium Finishing Plant and have not been completed.

- Develop and implement a single procedure to provide a consistent approach to all fissile material moves throughout the Plutonium Finishing Plant.
- Review the plant fissile material labeling process to identify when and where labels should be applied.
- List planned fissile material moves in a plan of the week and provide it to the DOE facility representative on a daily basis.
- Review the process for assigning assumed mass values for glovebox waste.

NFS reported in Weekly Summary 97-02 that a solid waste operator at Hanford Plutonium Finishing Plant discovered an isolated transport container, holding an undetermined amount of hood waste, located approximately 2 feet from a fixed array wagon containing 167 grams of plutonium. The criticality-prevention specification general limit requires a 3-foot minimum spacing between an undetermined amount of plutonium and quantities of plutonium greater than 100 grams. While developing the recovery plan, a material handler discovered the fixed array wagon cylindrical positioning restraints were not closed and fastened as required by the criticality-prevention specification.

On March 26, 1998, the DOE Office of Enforcement and Investigation issued a Preliminary Notice of Violation under the Price-Anderson Amendments Act to the prime contractor for the Hanford Site for nuclear criticality safety infractions and radiological work control violations at the Plutonium Finishing Plant. Investigators were concerned that the criticality safety procedural violations, conduct of operations deficiencies, and explosion-related violations represented contractor problems in establishing and implementing safety standards and in ensuring that

operations were conducted in accordance with procedures. Investigators also believe that the contractor missed opportunities to identify procedural adherence weaknesses and take effective corrective actions in some cases. The criticality safety deficiencies resulted in fissile material movement restrictions.

NFS has reported similar criticality safety concerns in several Weekly Summaries. Following are some examples.

- Weekly Summary 97-46 reported that a DOE facility representative at Rocky Flats Environmental Technology Site noticed that two containers were not stored in designated fixed positions in a storage cabinet, violating criticality spacing requirements. Investigators determined that a radiological control technician was not available to oversee transfer of the containers to another location, so the residue-sampling team locked the containers in the cabinet. Investigators determined that the residue-sampling team violated procedures when they opened a drum containing fissionable material without obtaining a criticality safety evaluation or determining criticality safety limits. (ORPS Report RFO--KHLL-371OPS-1997-0096)

- Weekly Summary 97-28 reported that waste management personnel at the Fernald Environmental Management Project violated two nuclear criticality safety controls. The first violation occurred when they moved five drums and two containers of enriched restricted material without documented approval for the operation. The second violation occurred because the supervisor assigned to the project was not trained as a fissionable material handler supervisor. (ORPS Report OH-FN-FDF-FEMP-1997-0038)

This event underscores the importance of proper nuclear material handling. Facility managers should ensure that all operators and supervisors follow all applicable nuclear material handling procedures. This is especially important because of the criticality safety issues that are involved. This event also underscores the importance of identifying appropriate corrective actions and implementing them in a timely manner. The following references provide guidance for facility managers and technicians who manage or handle nuclear materials.

- DOE O 420.1, *Nuclear Criticality Safety*, provides direction for establishing nuclear criticality safety program requirements.

- DOE O 5480.22, *Technical Safety Requirements*, provides requirements for preparing technical safety requirements (formerly called operational safety requirements) for non-reactor nuclear facilities. Paragraph 9.b states, in part: "Technical Safety Requirements shall define the operating limits and surveillance requirements, the basis thereof, safety boundaries, and management or administrative controls necessary to protect the health and safety of the public and to minimize the potential risk to workers from the uncontrolled release of radioactive or other hazardous materials and from radiation exposure due to inadvertent criticality."

- DOE O 5480.23, *Nuclear Safety Analysis Reports*, specifies operational controls to be included in an approved safety basis, including training and needed approvals.

- DOE O 5480.19, *Conduct of Operations Requirements for DOE Facilities,* chapter I, "Operations Organization and Administration," states: "A high level of performance in DOE operations is accomplished by establishment of high operating standards by management . . . by providing sufficient resources to the

operations department, by ensuring personnel are well trained . . . and by holding workers and their supervisors accountable for their performance in conducting activities. Chapter II, "Shift Routines And Operating Practices," requires personnel to adhere to operating procedures and sound operating practices. The Order also states that it is the responsibility of the on-shift operating crew to safely operate the facility through adherence to operating procedures and technical specification or operational safety requirements and through the use of sound operating practices.

- DOE O 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*, states that the purpose of the Order is to assure that all persons are qualified to carry out their assigned responsibilities.

KEYWORDS: nuclear criticality safety, work control

FUNCTIONAL AREAS: Nuclear/Criticality Safety, Operations

4. FIRE SUPPRESSION SYSTEM PIPING OBSTRUCTIONS

On June 4, 1998, at the Idaho National Engineering and Environmental Laboratory Central Facilities Area, Fire Protection personnel confirmed the presence of foreign matter inside the fire suppression system piping. Construction workers originally discovered the foreign material when they re-routed the piping system in the fall of 1997. They immediately notified the fire protection engineers. Facility operations personnel and a fire protection engineer removed ten sprinkler heads for testing and discovered that eight were partially obstructed and two were completely obstructed with a thick, oily substance. Obstructions in fire suppression system piping can render the system inoperable and may allow fires that result in excessive damage to facilities or endanger the lives of building occupants (ORPS Report ID--LITC-CFALL-1998-0002)

Inspection of the foreign matter inside the sprinkler system piping indicated that the blockage might have been caused by cutting oils, sealing compound residue, or microbiological growth. Investigators determined that the sprinkler system was originally installed in the 1960s as a dry-pipe system and was converted to a wet-pipe system in 1978. They also determined that personnel performed periodic system testing as required by National Fire Protection Association standards. The facility manager implemented 4-hour fire watches until the system is operable and they have determined that similar conditions do not exist elsewhere on site.

OEAF engineers searched the ORPS database and found five occurrences involving fire sprinkler system blockage. Following are summaries of these occurrences.

- On September 29, 1997, at Argonne National Engineering Laboratory-West, maintenance workers performing sprinkler system flow tests discovered that flow was prevented by a blockage caused by a rag left inside piping during construction. Investigators determined that acceptance testing performed in 1992 was inadequate because it did not identify the blockage. (ORPS Report CH-AA-ANLW-FCF-1997-0006)

- On March 30, 1995, at the Savannah River Site, fire department personnel determined that a sprinkler system had failed a blockage test. The blockage resulted from a build-up of a "soft mud-like material" in the sprinkler system. Investigators believed that this material was pipe preparation material residues left in the system during installation combined with microorganisms common to stagnant water systems. (ORPS Report SR--WSRC-LTA-1995-0037)

- On November 4, 1994, at the Hanford Site, sprinkler system inspectors discovered an obstruction in a section of piping when they performed operability tests following system modifications. They disassembled the section and discovered that it was plugged with grit and scale. They did not identify the source of the grit and scale. (ORPS Report RL--PNNL-PNNLNUCL-1994-0060)

- On October 3, 1994, at the Rocky Flats Plant, fire department personnel discovered blockage in a reducer fitting in a sprinkler system. They cleared the "dirt" causing the blockage and conducted a flow test. They did not identify the source or physical characteristics of the "dirt." (ORPS Report RFO--EGGR-PUFAB-1994-0197)

- On April 23, 1993, at the Oak Ridge K-25 Site, fire system inspectors discovered plugged sprinkler system valves. The foreign material plugging the valves consisted of iron oxide and soil. Investigators determined that the iron oxide was the result of oxidation of the inside of the sprinkler pipes; the soil was carried into the sprinkler system by dirty fire water. (ORPS Report ORO--MMES-K25GENLAN-1993-0011)

This occurrence underscores the importance of inspecting and testing fire protection sprinkler systems. The sprinkler system in this occurrence was inspected in accordance with National Fire Protection Association standards. However, NFPA 25, *Inspection, Testing, and Maintenance of Water-based Fire Protection Systems*, requires examining systems internally for obstructions where conditions exist that could cause obstructed piping, such as when fire pumps take their suction from open bodies of water. Systems should also be examined internally when obstructive materials are observed during maintenance or routine flow testing. Pipe inside diameters may also be reduced by pipe incrustation where the water supply contains lime or magnesia. Deep wells and water containing natural salts tend to corrode pipe interiors.

In general, DOE facility managers should ensure that surveillances of operational safety-related systems are completed and that these systems are properly maintained. If the system cannot pass surveillances or be maintained operational, appropriate compensatory measures should be taken. DOE O 5480.22, *Technical Safety Requirements*, general principle 1, states: "A system is considered operable as long as there exists assurance that it is capable of performing its specified safety function(s)."

Facility managers responsible for fire safety should ensure that systems are installed, inspected, and maintained using NFPA standards. NFPA 13, *Installation of Sprinkler Systems*, is the fundamental document that governs the design and installation criteria for installing sprinkler systems. NFPA 25, *Inspection, Testing, and Maintenance of Water-based Fire Protection Systems*, is another reference that facility managers should consult when performing acceptance testing, periodic testing, and maintenance. The NFPA *Fire Protection Handbook*, section 6, "Care and Maintenance of Water-based Extinguishing Systems," contains information on maintaining sprinkler system piping and discusses obstruction identification and system flushing. Ordering information for NFPA documents can be found at the NFPA Home Page located at URL http://www.nfpa.org. DOE implementation of NFPA 25 can be found at the DOE Fire Protection Home Page at URL http://nattie.eh.doe.gov:80/fire/directives.html.

DOE O 420.1, *Facility Safety*, and DOE O 440.1, *Worker Protection Management for DOE Federal and Contractor Employees*, offer broad objectives in fire protection and rely principally on NFPA codes and standards and the fire protection requirements of local building codes.

KEYWORDS: fire suppression, inspection, surveillance

FUNCTIONAL AREAS: Fire Protection

5. PIPEFITTER INJURED WHILE ERECTING PORTABLE LIFT

On June 8, 1998, at the Los Alamos National Laboratory High Explosives Machining and Pressing Facilities, a portable personnel lift fell and pinned a pipefitter to the floor as he and an electrician attempted to erect the lift from a reclined position to a vertical position. The electrician called 911, then used a lever to move the equipment off the pipefitter. Fire department paramedics responded and transported the pipefitter to the hospital. After initial evaluation and treatment, he was transferred to another hospital for further evaluation of possible neurological and head injuries. Hospital personnel treated him for a laceration on his forehead and a sprain to his wrist and foot and, after overnight observation, released him to return home. Facility medical personnel evaluated the electrician, who had been knocked to the floor by the lift, and released him. Facility Management personnel secured the area where the lift fell and suspended use of the lift. Investigators reported that the two workers were using an authorized work package to install a reel on a hoist located about 15 feet above the floor, but the work package and associated activity hazard analysis did not specify using the lift. Investigators determined that the workers had never erected the lift before and that they did not consult the lift manual or properly use the lift design features for erecting it. This event is significant because failure to adhere to manufacturer recommendations and warnings when operating equipment resulted in injuries and could have resulted in a fatality. (ORPS Report ALO-LA-LANL-HEMACHPRES-1998-0009)

The UpRight, Incorporated, model UL-40, Series II, portable personnel lift (classified as a manually propelled elevating aerial platform by OSHA) weighs about 1,000 pounds and is about 9-1/2 feet high by 4-1/3 feet long by 2-1/2 feet wide in the vertically stowed position. Figure 5-1 shows the lift in the reclined position. (See Weekly Summary 98-21 for additional descriptive information about the lift, including pictures.) The lift is designed to be easily transported in a reclined position at about a 45-degree angle and set up by a single individual using an extensible handle located on the lift for leverage. The lift is equipped with two bases: one is used to transport the lift in the reclined position; the other is used to operate the lift and move it while in a vertical position. A cylinder assembly functions as a crossbar and supports the lift in the reclined position. When the lift is in a vertical position, the base used for transporting it in a reclined position can be folded up against it by retracting a cylinder assembly retaining pin.

Figure 5-1. Portable Personnel Lift in Reclined Position (Courtesy UpRight, Incorporated)[1]

Investigators determined that the pipefitter and the electrician attempted to erect the lift by supporting its weight while retracting the cylinder assembly retaining pin and did not use the extensible handle located on the lift. When they retracted the pin, they could not support the

[1] An UpRight, Incorporated, portable personnel lift is shown. Additional information is available at URL http://www.upright.com.

weight of the lift, and it fell and trapped the pipefitter underneath it. Investigators determined that the two workers had used the lift before, but they had never set it up. They also determined that the workers did not consult the lift manual (stored on the lift) to obtain instructions and warnings about lift set-up. Investigators determined that a manufacturer representative trained only one facility employee in using the lift and that employee performed the initial set up of the lift for previous work at the facility. The lift was involved in two other recent events, and the facility manager had directed an evaluation of procedures and/or training requirements for operating this type of equipment. Because of this event, the facility manager suspended use of the lift until the procedures and/or training requirements are further evaluated and approved. DOE Albuquerque Operations Office managers, Los Alamos National Laboratory advisors, and contractor facility management are investigating this event with the rigor of a Type B investigation as defined by DOE O 225.1A, *Accident Investigations*.

NFS reported events involving equipment set-up in several Weekly Summaries. Facility personnel have also reported several similar events to ORPS. Following are some examples, including two events that involved the same portable personnel lift.

- Weekly Summary 98-21 reported that a Facility Management employee at the Los Alamos National Laboratory observed a subcontractor working at an elevated height using the portable personnel lift without the outriggers installed. He also observed that someone had inserted metal blocks into the outrigger ports to bypass the safety interlocks. (ORPS Report ALO-LA-LANL-HEMACHPRES-1998-0006)

- Weekly Summary 98-09 reported that a mobile crane operator at the Strategic Petroleum Reserves Weeks Island Site was nearly hit by a crane jib extension when it swung free of the cradle and struck the crane cab. The jib broke the window and windshield, damaged the cab structure, and stopped approximately 6 inches from the operator's head. Investigators determined that the operator failed to release tension on a cable when he raised the crane boom, causing the jib extension to pull free from its cradle. (ORPS Report HQ--SPR-WI-1998-0001)

- On February 13, 1998, at Los Alamos National Laboratory, a contractor attempted to move the portable personnel lift from the reclined position to a vertical position on a flatbed truck, and one wheel of the lift fell into a hole in the truck bed. The lift toppled over, struck the contractor, and came to rest partially on the truck and partially on the ground. The contractor received a minor arm flesh injury. (ORPS Report ALO-LA-LANL-HEMACHPRES-1998-0002)

- On November 22, 1995, at Los Alamos National Laboratory, a forklift rolled over and pinned the driver in a ditch when its rear wheel dropped off a concrete walkway. The severely injured driver was extricated and transported to the hospital. Investigators determined the driver was not a trained and certified forklift operator and that he did not follow forklift safety policy. (ORPS Report ALO-LA-LANL-NUCSAFGRDS-1995-0004)

The 1995 forklift event at the Los Alamos National Laboratory underscores the importance of a lessons learned program. The DOE Type A report, *Type A Investigation Report of a Forklift Accident at Los Alamos National Laboratory on November 22, 1995*, dated January 1996, provides a complete description of the accident, the investigation, and the causal analysis. The report discusses findings and judgements of need regarding the uniform application of safety requirements and performance and controls for the use of equipment (forklifts). While the conclusions in this report arose from an event involving a forklift, they are applicable to other types of equipment, such as the portable personnel lift. DOE-STD-75-01-95, *Development of DOE Lessons Learned Programs*, provides a framework for a lessons learned program. Sections 5.1.1 and 5.12 identify accident and investigation reports as sources of information that

should be considered for inclusion in a lessons learned program. Appendix A cites DOE rules and requirements that refer to lessons learned.

These events are significant because workers were injured when they failed to operate equipment according to approved methods. They also underscore the importance of using effective work control practices and job planning and the need to be alert to potential hazards. Industrial safety programs are effective only when facility personnel practice safety on the job by following site safety procedures and their training. Equipment operators must be qualified and knowledgeable about how to set up equipment and operate it using its design safety features and should request assistance from appropriate managers when performing unfamiliar operations. Facility managers and supervisors should ensure that personnel are qualified and trained to handle equipment safely. A well-developed safety and health hazard analysis must be included in the work control process to help prevent injuries. The 1996 *Census of Fatal Occupational Injuries* published by the U. S. Department of Commerce, states that based on the 579 fatalities, 402 (70 percent) occurred when workers were struck by a falling object.

Managers and supervisors in charge of job performance should ensure that hazards associated with equipment are identified and included in the appropriate procedure steps and precautionary statements. DOE 0 440.1, *Worker Protection Management for DOE Federal and Contractor Employees*, states that the contractor must identify workplace hazards and evaluate the risk of associated worker injury or illness.

The *Type A Investigation Report of a Forklift Accident at Los Alamos National Laboratory on November 22, 1995*, dated January 1996, can be obtained by contacting the ES&H Information Center, (800) 473-4375, or by writing to U.S. Department of Energy, ES&H Information Center, EH-72, 19901 Germantown Road, Germantown, MD 20874. A DOE lessons learned document regarding this event is available at URL http://tis.eh.doe.gov/others/ll/lmes/100103.txt. DOE-STD-75-01-95, *Development of DOE Lessons Learned Programs*, and other lessons learned information may be obtained through the DOE Lessons Learned Information Services Home Page at URL http://tis.eh.doe.gov:80/others/ll/ll.html. Information on the 1996 *Census of Fatal Occupational Injuries*, can be obtained through the Bureau of Labor Statistics Safety and Health Statistics Homepage at URL http://stats.bls.gov/oshhome.htm.

KEYWORDS: injury, equipment, man lift, safety hazard

FUNCTIONAL AREAS: Industrial Safety, Procedures, Training and Qualification

OEAF FOLLOW-UP ACTIVITY

1. CORRECTION TO WEEKLY SUMMARY 98-22, ARTICLE 3

Article 3, "Bioassay Program Deficiencies Lead to Stand-Down of Radiological Activities at Mound" in Weekly Summary 98-22 incorrectly stated that bioassay program accreditation is required by 10 CFR 835. Regulatory amendments to 10 CFR 835 have not been finalized and it was premature to state that such a requirement will be included in the final amendments. The proposed DOE standard referred to in the article (*The Department of Energy Laboratory Accreditation Program for Radiobioassay)* will be finalized after the 10 CFR 835 amendments have been finalized.

KEYWORDS: bioassay, radiation protection

FUNCTIONAL AREAS: Radiation Protection

1998 OEWS READER SURVEY

Following is the 1998 OEWS Reader Survey. The responses to the previous surveys were extremely valuable in helping us understand the needs of our customers and chart the course for the OEWS and other OEAF products. We again request your participation to help us learn more about our readership and what you think is valuable. We firmly believe that understanding your needs and perceptions is crucial to ensuring that the OEWS and other OEAF products are useful, quality products that have real benefits to you and the DOE.

Please return the completed electronic survey by filling in the information and pressing the submit button at the bottom. If you cannot submit the survey electronically please return hard copies to:

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20251 Century Boulevard
Germantown, MD 20874
Phone: (301) 540-2396 Fax: (301) 540-2499
Internet: ccrow@rpihq.com

OEAF plans to provide information on the results of the survey in a future OEWS. Thank you in advance for your participation.

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1. What is your job title?

   - ❑ Facility Manager
   - ❑ Report Originator
   - ❑ Facility Representative
   - ❑ Program Manager
   - ❑ Other Manager
   - ❑ Engineer/Analyst
   - ❑ Supervisor
   - ❑ Instructor
   - ❑ Technician
   - ❑ Other/please enter your title_____

2. In which department do you usually work?

   - ❑ Criticality Safety
   - ❑ Facility Operations
   - ❑ Industrial Hygiene
   - ❑ Maintenance
   - ❑ Radiation Protection/Health Physics
   - ❑ Industrial Safety
   - ❑ Nuclear Safety
   - ❑ Operating Experience Analysis/Lessons Learned
   - ❑ Training
   - ❑ Quality
   - ❑ Security
   - ❑ Engineering/Technical Support
   - ❑ Other/please specify_____

3. How long have you been in your current position?

   _____

4. How many total years of experience do you have?

   _____

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5. Who is your employer?

   - ❑ DOE
   - ❑ Department of Transportation (DOT)
   - ❑ Operating Contractor for DOE
   - ❑ Other Contractor to DOE
   - ❑ Subcontractor to an Operating Contractor
   - ❑ Nuclear Regulatory Commission (NRC)
   - ❑ Environmental Protection Agency (EPA)
   - ❑ Occupational Safety and Health Administration (OSHA)
   - ❑ Other Federal Government
   - ❑ State Regulatory Agency
   - ❑ Commercial Nuclear Utility
   - ❑ University
   - ❑ Medical Facility
   - ❑ Other (please enter your organization)_____

6. Does your facility or organization (e.g., company, office, site) have a lessons-learned program?

   - ❑ Yes
   - ❑ No (Proceed to Question 11)

7. If yes, would you describe the program as formal (i.e., written guidance or procedures)?

   - ❑ Yes
   - ❑ No (Proceed to Question 11)

8. If yes, does the program include identification of specific corrective actions from reviewing operating experience/lessons-learned documents that may be applied to your facility?

   - ❑ Yes
   - ❑ No (Proceed to Question 11)

9. If yes, does the program include tracking the identified corrective actions?

   - ❑ Yes
   - ❑ No (Proceed to Question 11)

10. If yes, does the program track the effectiveness of the corrective actions?

    - ❑ Yes
    - ❑ No

11. Does your facility have a lessons-learned coordinator or point-of-contact?

    - ❑ Yes
    - ❑ No

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Name: _____

Facility: _____

Dept./Organization: _____

Phone Number: _____

Email Address: _____

12. Do you have formal distribution of the OEWS within your organization?

    - ❑ Yes
    - ❑ No

13. What is the physical appearance of the OEWS when it arrives?

    - ❑ Acceptable
    - ❑ Unacceptable

14. Do you share your copy of the OEWS?

    - ❑ Yes, with ___ people
    - ❑ No

15. How often do you read the OEWS?

    - ❑ Every week
    - ❑ Every other week
    - ❑ Once a month
    - ❑ Less frequently than once a month

16. How do you use the OEWS in your job (check all that apply)?

    - ❑ Corrective Actions Program
    - ❑ Industrial Safety Program
    - ❑ Job Planning
    - ❑ Lessons Learned Program
    - ❑ Nuclear Safety Program
    - ❑ ORPS Preparation
    - ❑ Training Program
    - ❑ Other/please specify (e.g., teaching materials) _____

17. How useful in your job are the articles in the OEWS?

    - ❑ Very useful (e.g., at least one article in every issue is pertinent to your job)
    - ❑ Somewhat useful (e.g., one article in every 4/5 issues is pertinent to your job)
    - ❑ Rarely useful (e.g., only one article used each quarter)
    - ❑ Never useful

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18. Do you believe the OEWS has contributed to improved safety performance at your site?

- ❑ Yes
- ❑ No

19. Do the articles in the OEWS contain sufficient information?

- ❑ Yes
- ❑ No (If no, what information do you feel should be included?)

_____

_____

20. On average, the length of the OEWS articles is:

- ❑ Too long (Many articles contain extraneous information and take too long to read.)
- ❑ Acceptable length (Most articles contain only pertinent information.)
- ❑ Too short (Most articles are missing pertinent information.)

21. How easy to understand are the articles in the OEWS?

- ❑ Too difficult (The writing is complex; many technical terms are not adequately defined.)
- ❑ Acceptable (The writing is clear; technical terms are adequately defined.)
- ❑ Too tedious (The writing is simplistic; too many common technical terms are defined.)

22. How useful are the "DOE Guidance" sectionsof OEWS articles (usually the last paragraph or two of the articles)?

- ❑ Very useful
- ❑ Somewhat useful
- ❑ Rarely useful
- ❑ Never useful

23. How useful are the suggested actions given in the OEWS articles?

- ❑ Very useful
- ❑ Somewhat useful
- ❑ Rarely useful
- ❑ Never useful

24. How useful are the following parts of OEWS articles when they are included? ("0" = Not Useful, "5" = Very Useful)

Description of event and significance (first paragraph)	0	1	2	3	4	5
Details of event (second paragraph)	0	1	2	3	4	5
Investigation and causes of event	0	1	2	3	4	5
Corrective actions	0	1	2	3	4	5
Similar events	0	1	2	3	4	5
Regulatory guidance	0	1	2	3	4	5

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Key words	0	1	2	3	4	5	
Functional areas	0	1	2	3	4	5	
Trend of similar occurrences (graph)	0	1	2	3	4	5	
Causes of similar occurrences (graph)		0	1	2	3	4	5
Distribution of similar occurrences by field office (graph)	0	1	2	3	4	5	
Photograph of occurrence scene	0	1	2	3	4	5	
Floor plan of occurrence scene		0	1	2	3	4	5
Drawing or photograph of equipment	0	1	2	3	4	5	

25. Some of the information presented in an OEWS article is based on the investigation and critique of the occurrence. Because new information may be uncovered during the investigation, there is a trade-off between the timeliness of an article and attributes such as completeness and depth of analysis. For each attribute in the pairs below, circle the one that is most important to you in an OEWS article. If you prefer timeliness versus completeness, circle timeliness. If you prefer depth of analysis versus timeliness, circle depth of analysis.

    Timeliness **Completeness**

    Timeliness **Depth of Analysis**

26. How frequently should DOE publish the OEWS?

    - ❑ Once a week
    - ❑ Once every two weeks
    - ❑ Once per month
    - ❑ Other/Please specify_____

27. Since you have been receiving the OEWS, has the overall quality/usefulness:

    - ❑ Increased
    - ❑ Decreased
    - ❑ No change
    - ❑ Don’t know

28. Over the last year, has the overall quality/usefulness:

    - ❑ Increased
    - ❑ Decreased
    - ❑ No change
    - ❑ Don’t know

29. Which of the following subjects do you think should be covered in the OEWS?
    ("0" = Never include, "3" = OEWS covers the subject sufficiently, "5" = Include more frequently)

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Criticality Safety	0	1	2	3	4	5	
Industrial Safety	0	1	2	3	4	5	
Transportation	0	1	2	3	4	5	
Radiation Protection	0	1	2	3	4	5	
Work Control	0	1	2	3	4	5	
Conduct of Work	0	1	2	3	4	5	
Conduct of Operations		0	1	2	3	4	5
Training	0	1	2	3	4	5	
Engineering & Design	0	1	2	3	4	5	
Lessons Learned from Commercial Nuclear Utilities		0	1	2	3	4	5
Operating Experience Analysis		0	1	2	3	4	5
Nuclear Safety	0	1	2	3	4	5	
Good Practices		0	1	2	3	4	5
Cost-Beneficial Activities	0	1	2	3	4	5	
Emergency Planning/ Environmental Protection	0	1	2	3	4	5	
Other/please specify_____							

30. How would you improve the OEWS (what are important attributes the OEWS should have but are currently lacking/inadequate)?

_____

_____

_____

_____

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31. Should DOE periodically publish an index of OEWS article titles to help find past articles of interest to readers?

    - ❑ Yes
    - ❑ No (Proceed to Question 33)
    - ❑ Not sure (Proceed to Question 33)

32. If yes, which index subjects would be most useful (check all that apply)?

    - ❑ OEWS article title
    - ❑ Facility where event occurred
    - ❑ Subject of article (key words)
    - ❑ All of the above

33. What other Operating Experience or lessons learned products would be useful to your facility?

    _____
    _____

34. In your opinion, is there a need for another Operating Experience product which is published:

    - ❑ Monthly
    - ❑ Quarterly
    - ❑ Semi-annually
    - ❑ Annually
    - ❑ No need

35. Do you have any suggestions for content, format, medium, length, distribution, focus, etc.?

    _____
    _____
    _____
    _____

36. In your opinion, would a periodic publication highlighting outstanding programs at DOE facilities, sites, or organizations be useful?

    - ❑ Yes
    - ❑ No
    - ❑ Not sure

37. Please indicate any specific programs at your facility that you consider to be outstanding and, as such, would be candidates for such a publication.

    Facility: _____

    Program: _____

    Contact Name: _____

    Phone Number: _____

    Email Address: _____

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38. Are you aware that you can write an article and work with the OEAF engineers to get it published in the OEWS?

    ❑ Yes
    ❑ No

    If you have information for an article please provide the following:

    Contact Name: _____

    Phone Number: _____

    Email address: _____

39. Are you able to access the OEWS electronically on the network or through Internet access?

    ❑ Yes
    ❑ No

40. Are you aware that you can perform electronic word searches of all OE Weekly Summaries from the Weekly Summary web page?

    ❑ Yes
    ❑ No

    If yes, how often do you use this feature?

    ❑ Once a week
    ❑ Once per month
    ❑ Never
    ❑ Other/please specify_____

41. How useful in your job are the Safety Notices published by the Office of Nuclear Safety?

    ❑ Very useful
    ❑ Somewhat useful
    ❑ Rarely useful
    ❑ Never useful
    ❑ Not aware of Safety Notices (Proceed to Question 45)

42. Do the Safety Notices contain sufficient information?

    ❑ Yes
    ❑ No

    If no, what information do you feel should be included?

    _____
    _____

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43. On average, the length of the Safety Notices is:

- ❑ Too long (Most notices contain extraneous information and take too long to read.)
- ❑ Acceptable (Most notices contain only pertinent information.)
- ❑ Too short (Most notices are missing pertinent information.)

44. How easy to understand are the Safety Notices?

- ❑ Too difficult (The writing is complex; many technical terms are not adequately defined.)
- ❑ Acceptable (The writing is clear; technical terms are adequately defined.)
- ❑ Too tedious (The writing is simplistic; too many common technical terms are defined.)

45. What other subjects for Safety or Technical Notices would be useful to your facility?

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46. Would you like to receive the OEWS electronically (usually available the day it goes to print)?

- ❑ Yes
- ❑ No

If yes, please provide the following information:

Name	
Title	
Company	
Street Address	
City, State, Zip	
Phone Number	
Email Address	